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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEFAN PARKVALL, PÅL FRENGER,
and ERIK DAHLMAN

Appeal 2008-3233
Application 09/742,283
Technology Center 2600

Decided: September 5, 2008

Before KENNETH W. HAIRSTON, MAHSHID D. SAADAT,
and JOHN A. JEFFERY, *Administrative Patent Judges*.

JEFFERY, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from the Examiner's rejection of claims 1, 3, 5, 8-16, 18, 21-28, 30, 32, 34-41, 43, and 46-50. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

STATEMENT OF THE CASE

Appellants invented a data communications system that selectively transmits data in one direction on a particular channel when the quality or condition on a channel in the opposite direction is sufficient to ensure a reasonable likelihood that the transmitter will accurately receive and decode feedback messages.[1] Claim 1 is illustrative:

1. For use in a system where data packets are communicated from a first node over a first channel to a second node and a feedback signal is sent back to the first node from the second node over a second channel, a method comprising:

the first node determining a condition of the second channel,

the first node determining whether the condition of the second channel is sufficient for the first node to accurately continue receiving a feedback signal from the second node, and

based on the determined condition of the second channel, the first node scheduling further transmission of data packets over the first channel including delaying further transmission of data packets over the first channel until the quality of the second channel exceeds a predetermined threshold,

wherein the feedback signal is an acknowledge signal, a negative acknowledge signal, or a lost signal corresponding to a data packet transmitted over the first channel.

The Examiner relies on the following prior art references to show unpatentability:

Labonte	US 5,991,286	Nov. 23, 1999
Balachandran	US 2002/0036992 A1	Mar. 28, 2002 (filed Dec. 29, 2000)

[1] *See generally* Spec. 7:27-9:27; Abstract.

Garceran	US 6,522,888 B1	Feb. 18, 2003 (filed Aug. 31, 1999)
Yuen	US 2003/0185286 A1	Oct. 2, 2003 (eff. filed Apr. 29, 1996)

1. Claims 1, 26, 27, 30, 32, and 38 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Yuen and Balachandran.
2. Claims 3, 5, 8-12, 14-16, 18, 21, 22, 28, 34-36, 39-41, 43, 46, and 47 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Yuen, Balachandran, and Labonte.
3. Claims 13 and 37 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Yuen, Balachandran, and Garceran.
4. Claims 23-25 and 48-50 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Yuen, Balachandran, Labonte, and Garceran.

Rather than repeat the arguments of Appellants or the Examiner, we refer to the Briefs and the Answer[2] for their respective details. In this decision, we have considered only those arguments actually made by Appellants. Arguments which Appellants could have made but did not make in the Briefs have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence:

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[2] We refer to (1) the Appeal Brief filed November 14, 2007; (2) the Examiner's Answer mailed November 27, 2007; and (3) the Reply Brief filed December 3, 2007 throughout this opinion.

1. Yuen discloses a cellular system that employs a handoff in which a user first communicates with a first base station, and then communicates with a second base station whose received power is stronger (Yuen, ¶ 0168; Fig. 22).

2. As shown in Figure 22, Yuen's system includes a central control unit 63, base stations 61, 62, and a remote unit 60. The remote unit transmits data to the first base station 61 at a first data rate and power level, and then hands off from the first base station to a second base station 62 via the central control unit responsive to signal quality monitoring and comparison (Yuen, ¶ 0171; Fig. 22).

3. The remote unit contains circuitry that initiates handoff to the second base station responsive to the quality of the signal that the remote unit receives from the first base station (i.e., when this received signal quality falls below a predetermined threshold) (Yuen, ¶¶ 0172-74, 0178, 0184; Figs. 22-23).

4. When handoff is initiated, the remote unit queues and stores data that would have been transmitted to the first base station during the handoff period (Yuen, ¶¶ 0174, 0186).

5. Following a completed handoff, this stored data is subsequently transmitted from the mobile unit to the second base station at a second data rate (Yuen, ¶¶ 0174; 0187-88).

6. After the stored data is transmitted to the second base station, the remote unit continues transmitting to the second base station at a data rate that typically matches that which was used to communicate with the first base station (Yuen, ¶¶ 0177, 0189).

7. Balachandran discloses a system that communicates data packets wirelessly between a base station 12' and a mobile unit 40' (Balachandran, ¶ 0017; Fig. 2). Such systems can utilize selective Automatic Repeat Request (ARQ) techniques for error recovery (Balachandran, ¶¶ 0003-04, 0019).

8. Under the protocol used in Balachandran, each packet is (1) segmented into blocks; (2) transmitted; and (3) acknowledged as received (Balachandran, ¶ 0019). If a block is negatively acknowledged after a predetermined time, it is scheduled for retransmission (*Id.*).

9. The transmitter can poll the receiver to obtain these acknowledgements (e.g., ACK/NACK receipt status) with respect to the transmitted blocks of the packet (Balachandran, ¶¶ 0020-29).

10. Labonte's cellular data communications system involves selection of low-level or high-level modulation (Labonte, col. 7, l. 32 - col. 8, l. 23; Figs. 2A, 3).

11. Labonte teaches making two simultaneous measurements regarding whether the system is sufficient for packet data communications: (1) a mobile station 54 measuring downlink signal quality on a packet-control channel, and (2) a base station 56 measuring uplink signal quality (Labonte, col. 7, ll. 38-53; Fig. 3 (Steps 94, 96, 98)).

12. Garceran discloses a wireless communication system that can dynamically determine RF coverage using (1) various information or parameters (e.g., operating conditions, mobile identity, traffic load, frequency, speed, direction, time and/or mobile type), and/or (2) measurements (e.g., signal strength measurements) made at the wireless unit and/or the base station (Garceran, col. 3, ll. 8-67; Fig. 2).

THE REJECTION OVER YUEN AND BALACHANDRAN

We first consider the Examiner's obviousness rejection of claims 1, 26, 27, 30, 32, and 38 over Yuen and Balachandran. The Examiner takes the position that the handoff procedure of Yuen fully meets all recited limitations of claim 1 except for the particulars of the feedback signal recited in the last clause of the claim—a feature that is said to be taught by Balachandran (Ans. 5-7).

Regarding representative claim 1,[3] Appellants argue that the cited prior art lacks (1) the claimed first and second nodes; (2) delaying further transmission of data over the first channel from the first node to the second node based on the condition of the second channel from the second node to the first node; and (3) the recited feedback-related features (App. Br. 13-18; Reply Br. 5-6). Appellants add that the combination of Yuen and Balachandran is based on improper hindsight since neither reference is concerned with ensuring data is not transmitted in a channel in one direction if the condition of a feedback channel in the opposite direction is poor (App. Br. 18-20).

The Examiner indicates that the mobile unit 60 in Yuen corresponds to the recited "first node," and the base stations 61 and 62 correspond to the recited "second node." The Examiner further notes that the recited "first channel" corresponds to the "uplink" between the mobile unit and the base station(s) in Yuen, and (2) the "second channel" corresponds to the "downlink" between the base station(s) and the mobile unit (Ans. 14-17).

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[3] Appellants argue claims 1, 26, 27, 30, 32, and 38 together as a group. *See* App. Br. 13-20. Accordingly, we select claim 1 as representative. *See* 37 C.F.R. § 41.37(c)(1)(vii).

The Examiner further notes that handing off from one base station to another in Yuen is based on the condition of the "downlink signal/channel." With this interpretation, the Examiner reasons that since (1) the mobile unit in Yuen queues data when handing off from the first to the second base station, and (2) transmission is continued with the second base station following this handoff, the first node effectively delays further transmission of data over the first channel (i.e., from the mobile unit to the base station) until the quality of the second channel exceeds a threshold (Ans. 14-20).

The Examiner further contends that combining Balachandran with Yuen is proper since Yuen teaches monitoring downlink signal quality to control uplink transmissions, and employing a particular type of feedback signal with a particular protocol such as that disclosed by Balachandran would have been an obvious improvement to Yuen's system (Ans. 6, 7, 20).

ISSUE

The issue before us, then, is whether Appellants have shown that the Examiner erred in finding the limitations of claim 1 would have been obvious to ordinarily skilled artisans in view of the collective teachings of Yuen and Balachandran. The issue turns on whether the cited prior art discloses (1) the claimed first and second nodes; (2) delaying further transmission of data over a first channel (i.e., from the first node to the second node) based on the condition of a second channel (i.e., from the second node to the first node); and (3) the recited feedback signal. The issue also turns on whether the references' teachings are reasonably combinable.

For the following reasons, we find that Appellants have not shown such error.

PRINCIPLES OF LAW

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966).

Discussing the question of obviousness of claimed subject matter involving a combination of known elements, *KSR Int'l v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007), explains:

> When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraida* [*v. AG Pro, Inc.,* 425 U.S. 273 (1976)] and *Anderson's-Black Rock*[*, Inc. v. Pavement Salvage Co.*, 396 U.S. 57 (1969)] are illustrative—a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

KSR, 127 S. Ct. at 1740. If the claimed subject matter cannot be fairly characterized as involving the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement, a holding of obviousness can be based on a showing that "there was an apparent reason to combine the known elements in the fashion claimed." *Id.* at 1740-41. Such a showing requires,

> "'. . . some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness' . .

> . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ."

Id. at 1741 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

If the Examiner's burden is met, the burden then shifts to the Appellants to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

ANALYSIS

We find no error in the Examiner's reliance on the collective teachings of Yuen and Balachandran to arrive at the claimed invention. Based on the functionality of Yuen noted in the Findings of Fact section above (FF 1-6), we find no error in the Examiner's interpretation of the recited "first node" as corresponding to the remote unit 60 in Figure 22, and the "second node" as corresponding to the base stations. First, since the remote unit both transmits and receives communications to and from the base stations (FF 1-3), the remote unit likewise functions as a "node" with respect to the base stations and therefore reasonably corresponds to the recited "first node."[4]

[4] Our interpretation reasonably comports with the Specification which likewise envisions a "node" as constituting wireless user equipment. *See* Spec. 8:28-29 ("In a preferred example embodiment, the first node is a base station in a radio communications network, and the second node is a wireless user equipment unit.").

Second, as shown in Figure 22, each base station is linked to a common central control 63 that functions to hand off communications from one base station to the other (FF 2). Thus, the base stations and the associated central control collectively form a "node" at least with respect to the remote unit—a node that is dynamically determined based on the relative location (via signal strength measurements) between the remote unit and the base stations.

Furthermore, nothing in claim 1 precludes the recited "second node" as comprising multiple base stations. Significantly, the claim calls for "*a* second node" (emphasis added). It is well settled, however, that the indefinite article "a" or "an" means "one or more" in open-ended claims containing the transitional phrase, "comprising." *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356 (Fed. Cir. 2000). Since claim 1 contains such an open-ended phrase in the preamble ("a method comprising…"), we therefore construe "a second node" as "one or more second nodes." *See id.* at 1357 (construing limitation calling for "a…continuous…chamber" as covering one or more continuous chambers). Therefore, even if we assume, without deciding, that each base station in Yuen is a separate "node," nothing in the claim precludes the recited "second node" as encompassing these multiple "nodes" (e.g., base stations) so long as they are distinct from the recited "first node." Such is the case in Yuen.

Additionally, we find that the remote unit's queuing and storing data during handoff, and subsequently transmitting this stored data to the second base station following handoff (FF 1-5) reasonably suggests delaying further

transmission of data packets over the first channel until the quality of the second channel exceeds a predetermined threshold as claimed.

First, Yuen's remote unit initiates handoff to the second base station when the quality of the signal that the mobile unit receives from the first base station falls below a predetermined threshold (FF 3). This signal, in our view, reasonably suggests a "feedback signal" received by the remote unit over a second channel as claimed. Even if this signal is a data signal as Appellants argue (Reply Br. 6), the fact that it is used as a basis for handoff (i.e., via signal quality measurements) (FF 3) means that it nonetheless constitutes a "feedback signal" at least with respect to that threshold-based determination.

Second, while it is true that the remote unit communicates with a different base station following handoff, this communication is nevertheless with respect to a "second node" in light of our interpretation noted above. As such, the delay in transmitting to this second node during handoff (i.e., while the remote unit queues and stores data) (FF 4) effectively delays further transmission of data over the first channel until the handoff is complete (FF 5). Since this handoff is based on the detected quality of the received signal at the remote unit (FF 3), the remote unit effectively delays data transmission over the first channel until the quality of second channel exceeds a predetermined threshold (i.e., as a result of the handoff).

While Yuen does not disclose the particulars of the feedback signal recited in the last clause of claim 1, we see no reason why ordinarily skilled artisans could not include at least one of the recited feedback signals in Yuen's system in light of the teachings of Balachandran (FF 7-9).

While the "feedback signal" in Yuen is primarily used for signal quality determinations as noted above, providing an acknowledgement signal such as that disclosed by Balachandran (FF 7-9), would only enhance the integrity of data communicated between the nodes in Yuen. As Balachandran indicates, such an acknowledgement signal would, at a minimum, provide information regarding the need to retransmit blocks of data packets that were not received properly (FF 8). In our view, providing such a feature in Yuen—a system that likewise involves wireless data transmissions between a remote unit and a base station—would have been tantamount to the predictable use of prior art elements according to their established functions, an obvious improvement. *See KSR*, 127 S. Ct. at 1740.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner's rejection of representative claim 1. Therefore, we will sustain the Examiner's rejection of that claim, and claims 26, 27, 30, 32, and 38 which fall with claim 1.

THE REJECTION OVER YUEN, BALACHANDRAN, AND LABONTE

We now consider the Examiner's obviousness rejection of claims 3, 5, 8-12, 14-16, 18, 21, 22, 28, 34-36, 39-41, 43, 46, and 47 over Yuen, Balachandran, and Labonte (Ans. 9-13). Regarding representative independent claim 14,[5] Appellants argue that Labonte does not intentionally

[5] Appellants argue claims 3, 5, 8-12, 14-16, 18, 21, 22, 28, 34-36, 39-41, 43, 46, and 47 together as a group. *See* App. Br. 20-23. Accordingly, we select claim 14 as representative. Although Appellant nominally argues independent claim 39 separately (App. Br. 23), Appellants merely allege that the references fail to disclose certain limitations in that claim that are

delay transmitting packets over a downlink channel, but rather uses low-level modulation when channel conditions are poor (App. Br. 21). Appellants also note that Yuen is deficient in this regard since Yuen buffers data to allow the mobile unit to synchronize with the new base station during handoff—a delay decision ostensibly completely different from that claimed (App. Br. 22-23).

We will sustain the Examiner's rejection of representative claim 14. Appellants are correct that Labonte's cellular data communications system involves selection of low-level or high-level modulation (FF 10). Nevertheless, Labonte teaches making two simultaneous measurements regarding whether the system is sufficient for packet data communications: (1) a mobile station 54 measuring downlink signal quality on a packet-control channel, and (2) a base station 56 measuring uplink signal quality (FF 11).

The Examiner merely relied upon this teaching to show that ordinarily skilled artisans could measure signal quality at both ends of a communications path in lieu of a single end (Ans. 21). We find no error in this approach, and indeed see no reason why such simultaneous measurements as suggested by Labonte could not be performed at both ends of the link in Yuen (i.e., at the base station and remote unit).

Combining these teachings in the manner proposed by the Examiner is reasonable in our view, and would hardly be the result of impermissible hindsight as Appellants allege (App. Br. 24). Moreover, Appellants' arguments pertaining to the shortcomings of Labonte are unavailing as we

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commensurate with those claimed in claim 14. Accordingly, our analysis with respect to claim 14 also applies to the disputed limitations of claim 39.

find Yuen amply suggests delaying the transmission of data over a downlink channel for the reasons previously discussed.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner's rejection of representative claim 14. Therefore, we will sustain the Examiner's rejection of that claim, and claims 3, 5, 8-12, 15, 16, 18, 21, 22, 28, 34-36, 39-41, 43, 46, and 47 which fall with claim 14.

THE REJECTIONS OF CLAIMS 13, 23, 37, AND 48

Regarding the Examiner's obviousness rejections of (1) claims 13 and 37 over Yuen, Balachandran, and Garceran (Ans. 8), and (2) claims 23 and 48 over Yuen, Balachandran, Labonte, and Garceran (Ans. 13-14), Appellants contend that the prior art fails to teach (1) detecting *another* condition, and (2) controlling the data packet transmission over the first channel without regard to the condition of the second channel when the other condition is detected (App. Br. 25; emphasis added).

We will sustain these rejections as we find no error in the Examiner's reliance on Garceran for teaching the disputed limitations noted above (Ans. 8, 13, 14, 23, 24). Garceran discloses a wireless communication system that can dynamically determine RF coverage using (1) various information or parameters (e.g., operating conditions, mobile identity, traffic load, frequency, speed, direction, time and/or mobile type), and/or (2) measurements (e.g., signal strength measurements) made at the wireless unit and/or the base station (Garceran, col. 3, ll. 8-67; Fig. 2) (FF 12).

In our view, the various information and parameters listed in (1) above reasonably correspond to the recited "other condition." Furthermore, since Garceran indicates that the information noted in (1) or (2) above can

form the basis for various determinations including handoff candidates and serving base stations (Garceran, col. 3, ll. 46-50), we see no reason why ordinarily skilled artisans could not utilize such information pertaining to the "other condition" as an alternative basis for the handoff in Yuen. That Garceran teaches that this information not only can be received in conjunction with signal strength measurements, but also as an *alternative* to such measurements, only reinforces our conclusion that handoffs in Yuen (and the resulting data transmission associated with handoff as noted above) could reasonably be performed on the basis of another condition in lieu of signal quality determinations.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner's obviousness rejections of claims 13, 23, 37, and 48 over the collective teachings of the cited prior art.

THE REJECTION OF CLAIMS 24, 25, 49, AND 50

We will also sustain the Examiner's obviousness rejection of claims 24, 25, 49, and 50 over Yuen, Balachandran, Labonte, and Garceran (Ans. 13-14) which call for a detected condition to be (1) when a Doppler frequency exceeds a threshold (claims 24 and 49), and (2) when a load of a cell corresponding to the base station is less than a threshold (claims 25 and 50). While Appellants summarily allege that these features are not taught in Garceran (App. Br. 25), we note that merely pointing out what a claim recites without any supporting analysis or explanation is not a separate argument for patentability of the claim. *See* 37 C.F.R. § 41.37(c)(1)(vii).

In any event, Garceran teaches that the additional information noted above can include, among other things, frequency and traffic load (FF 12).

While these stated conditions are somewhat general and do not expressly indicate the specific conditions recited, Appellants have simply not persuasively rebutted the Examiner's prima facie case of obviousness which need not seek out precise teachings directed to the specific claimed subject matter, but "can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR* at 1741 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). On the record before us, Appellants have simply not shown why ordinarily skilled artisans could not have utilized these specific conditions as a basis for data transmission in the prior art system in light of the inferences and creative steps gleaned from the general teachings of Garceran which likewise indicates conditions for data transmission.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner's rejection of claims 24, 25, 49, and 50. Therefore, we will sustain the Examiner's rejection of those claims.

CONCLUSION OF LAW

Appellants have not shown that the Examiner erred in rejecting claims 1, 3, 5, 8-16, 18, 21-28, 30, 32, 34-41, 43, and 46-50 over the collective teachings of the cited prior art under § 103.

DECISION

We have sustained the Examiner's rejections with respect to all claims on appeal. Therefore, the Examiner's decision rejecting claims 1, 3, 5, 8-16, 18, 21-28, 30, 32, 34-41, 43, and 46-50 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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